

# THE SOCIAL SCIENCE ENCYCLOPEDIA

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Routledge & Kegan Paul  
London, Boston and Henley

a specific consequence (for example, food, water, avoidance of electric shock) according to a predetermined schedule. A consequence which, over trials, leads to an increase in the frequency of the response producing the consequence is referred to as a reinforcing stimulus. One of Skinner's major contributions has been to demonstrate that various schedules of reinforcement are characterized by unique response-frequency patterns. The ability to generate predictable response patterns has, in turn, found useful application in almost all areas of psychological research. Operant conditioning techniques also comprise the primary procedural foundation of behaviour modification, a set of intervention strategies which have been effectively employed in all major institutional settings, particularly in schools, mental hospitals, and care facilities for the psychologically retarded. Skinner was one of the pioneers of programmed learning. As a social critic, he has throughout his professional life advocated the reorganization of societies so that positive reinforcement (rewarding desired behaviours) rather than punishment or the threat of punishment be used to control human actions. His philosophy is detailed in two widely read books, *Walden Two* (1948), a novel about an entire society being controlled by operant techniques, and *Beyond Freedom and Dignity* (1971). Skinner's most important general contribution to the social and behavioural sciences may be to inspire methodological precision and accountability.

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#### Further Reading

Gilgen, A. R. (1982). *American Psychology since World War II: A Profile of the Discipline*, Westport, Connecticut.

See also: *behaviourism: conditioning, classical and operant; learning.*

#### Slavery

The definitions of slavery are as numerous as the societies in which slavery was to be found, and for good reason. The rights which owners had over their slaves and the duties by which they were bound constituted a bundle whose composition varied from society to society, although the slave's rights were always heavily circumscribed. Nevertheless, certain elements can probably be considered part of all these bundles: (1) The slaves were initially outsiders, brought by force to serve their new master, or they were in some way expelled from full membership of their society, for instance because of debt or as the result of a criminal trial. They might of course be the descendents of such individuals, depending on the degree to which a given society was prepared to assimilate slaves to full membership. (2) At least in the first generation slaves

were marketable commodities, at any rate where commercialization was present in any recognizable form. In other words, they were a species of property and it was this which distinguished slaves from other forms of forced labour. (3) Slaves had specific, generally inferior, occupations within the total division of labour. (4) Slaves were only held in their status by force or the threat of it, and in many ways the ending of the necessity for this marked a slave's full assimilation into the society.

Within this broad framework, the variations were enormous. This is to be expected from an institution which, in its various forms, existed all over the world – Australia is the only large and inhabited land mass where slavery never occurred – and from the beginnings of recorded human history until the twentieth century. Indeed, vestiges still survive, particularly in parts of the Islamic world and in various prostitution rackets. Nevertheless, the various slave systems may perhaps be distinguished according to two criteria, namely the degree of 'openness' and the extent to which the system of production was organized around it.

As regards the former question, particularly in societies whose social systems were organized around kinship groups, slavery could be a valued means of expanding the size of that group and the number of dependents: an important individual had beyond the limits set by the natural processes of reproduction. Since slaves were by definition outsiders, and thus people without kin of their own, they and their descendants could be incorporated into their owners' group, albeit often in a inferior position. On the other hand, where there was no premium on the number of kin an individual might have, or where the rules for the division of property made it advantageous to cut down the number of co-sharers, then slaves and their descendants could rarely gain admission to the higher ranks of society. In such circumstances, slaves would only be freed as a result of a formal act of manumission. These might occur with greater or lesser frequency, but in all such cases the ex-slave began his or her life of freedom in a lowly status, often still formally dependent on his or her former owner.

With regard to the second criterion, while slavery as such has existed in an enormous number of societies, the number in which it has been crucial to the organization of production has been relatively few. Ancient Greece, Ancient Rome and in modern times, the Southern United States, the Caribbean and parts of Brazil are the best known of these, although there were a number of other parts of the world, such as seventh-century Iraq, eighteenth-century colonial South Africa, Zanzibar in the nineteenth century, and parts of the Western and Central Sudan in the same period, for which a convincing case could be made. The emergence of economies based on slave labour depended on at least three conditions: (1) private property rights,

*and their offspring*

above all land, had to be established, and concentrated to the extent that extra-familial labour was required; (2) internal labour had to be insufficiently available, often as the result of the emancipation of earlier labourers, whether they were bonded peasants as in Ancient Greece or indentured servants as in colonial America – in other words, large-scale slavery was a consequence of large-scale freedom; (3) since slaves generally had to be bought, commercial market production had to be sufficiently developed. Although the demand for slaves on a grand scale may well have been logically prior to their supply, the continued existence of a slave society required the regular importation of new slaves, almost invariably through an organized slave trade, as – with the exception of the United States – slave populations were unable to reproduce themselves naturally.

In those cases where slavery was an integral part of the organization of labour, it tended to be rather towards the 'closed' pole of the assimilation continuum, even though the distinction between slave and free was nowhere as harsh as in the United States. For this reason, it was only in these societies (and not always even there) that a genuine slave culture was able to develop, as something distinct from that of the owners. Therefore, it was only in such societies that slaves were able to organize sufficiently for a large-scale rebellion to be possible, although individual acts of resistance were to be found wherever slavery existed. Very often, the major revolts were nonetheless the work of newly imported slaves, as the efficacy of repression tended to persuade second generation slaves of the futility of a rising, and led them to adopt an ambivalent attitude, which combined outward acquiescence with the effort to create a way of life for themselves that was as free and as comfortable as the circumstances permitted. In this way they tended to confirm the paternalist ideology of their masters, although this would then be rudely shattered by the general refusal of ex-slaves to remain in their former owners' service when, after the abolition of the institution, there was no longer legal compulsion for them to do so.

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#### *Further Reading*

Miller, J. C. (1984), *Slavery: A Comparative Teaching Bibliography*, Boston.

#### **Sleep**

Sleep is an area of human behaviour which occupies a third of the total life span and occurs throughout all societies and all of history. Despite its pervasiveness it has been largely ignored by social scientists until recently. As laboratory-based studies began in earnest in the early 1950s to describe the nature and dimen-

sions of sleep as a regularly recurring behaviour (Aserinsky and Kleitman, 1953; Dement and Kleitman, 1957), it became clear that this period was far from passive state of quiescence or non-behaviour. By recording the electroencephalogram (EEG), electro-oculogram (EOG) and electromyogram (EMG) continuously throughout the time period from waking into sleep until the final reawakening, it was found that there were regular cyclic changes within sleep itself. The discovery that sleep consists of two distinct types, Rapid Eye Movement (REM) sleep and Non-Rapid Eye Movement (NREM) sleep, which differed as much from each other as each did from wakefulness, led to a series of studies detailing the properties of these two states and their interactions within the context of the whole circadian (sleep-wake) rhythm. Each hour and a half the shift from a synchronized, physiologically quiescent, NREM sleep in which motor activity is intact, to the desynchronized, physiologically active, REM state accompanied by motor paralysis, became known as the ultradian rhythm. Within NREM sleep, variations in EEG pattern were further differentiated by convention into numerical sleep stages 1, 2, 3, 4. This laid the basis for the descriptive mapping of a night's sleep by the number of minutes spent in each sleep stage across the hours of the night and by the length of the ultradian cycle. This plot is referred to as sleep architecture. Once these conventions were established (Rechtschaffen and Kales, 1968) age norms for these sleep characteristics were also established (Williams, Karacan and Hirsch, 1974). Study of these developmental changes provided insight into sleep-wake relations. Individual differences in sleep parameters were also explored and related to variations in intelligence, personality and life-style. For example, although it is still a matter of some debate, long sleepers (those sleeping in excess of nine hours per night) were found to differ reliably from short sleepers (who sleep less than six hours per night) in psychological makeup, with long sleepers being more introverted, with lower energy and aggressive drive than short sleepers. It is clear that there is a selective difference in the type of sleep that is increased for these people. Long and short sleepers have the same amount of stages 3 and 4, but long sleepers have twice the amount of REM sleep and their REM sleep has increased eye movement density. Thus it is in the area of REM function that the need of long sleepers for more sleep must be explored. Other variations also occur, for example, in depth of sleep. These have been studied using the degree of auditory stimulation needed to produce an arousal as the measurement. This procedure has established that all sleep stages become progressively lighter with age, making sleep more fragile in the elderly.

Beyond the descriptive and correlational studies there has been the continuing challenge concerning